

CLAIMS

1. Process for producing dicarboxylic acids by
oxidation with oxygen or a gas containing oxygen
5 of a cycloaliphatic hydrocarbon in the presence of
an oxidation catalyst and of an oxidation solvent
that is lipophilic in nature, characterized in
that it comprises a step of extraction of the
dicarboxylic acids formed in the oxidation step,
10 consisting in carrying out, in liquid phase, an
extraction of the diacids using a first extraction
solvent in which at least the oxidation solvent
and the cycloaliphatic hydrocarbon are insoluble.
- 15 2. Process according to Claim 1, characterized in
that the oxidation solvent that is lipophilic in
nature is a monocarboxylic acid.
3. Process according to Claim 1 or 2, characterized
20 in that the extraction of the diacids is carried
out in a countercurrent-flow liquid/liquid
extraction column.
4. Process according to Claim 1, 2 or 3,
25 characterized in that the reaction medium derived
from the oxidation step is fed into the extraction
step under given temperature and pressure
conditions so as to maintain the cycloaliphatic
hydrocarbon in the liquid state.
30
5. Process according to one of the preceding claims,
characterized in that the extraction of the
diacids is carried out under given temperature and
pressure conditions so as to maintain the
35 cycloaliphatic hydrocarbon in the liquid state.
6. Process according to one of the preceding claims,
characterized in that the first extraction solvent
is chosen from polar solvents in the group

comprising water and alcohols.

7. Process according to Claim 6, characterized in that the first extraction solvent is water.
- 5 8. Process according to one of Claims 1 to 7, characterized in that a second extraction solvent is added to the extraction step, said second extraction solvent being non-miscible with the first extraction solvent, and not solubilizing the diacids formed.
- 10 9. Process according to Claim 8, characterized in that the first and the second extraction solvents are fed into the countercurrent extraction column.
- 15 10. Process according to Claim 8 or 9, characterized in that the second extraction solvent is chosen from the group comprising acyclic or cyclic, saturated hydrocarbons, and aromatic hydrocarbons.
- 20 11. Process according to Claims 8 to 10, characterized in that the second extraction solvent is the cycloaliphatic hydrocarbon to be oxidized.
- 25 12. Process according to one of Claims 3 to 11, characterized in that the oxidation medium is fed into the extraction column at an intermediate position between the two ends of the column.
- 30 13. Process according to one of the preceding claims, characterized in that the hydrocarbon is a cycloalkane.
- 35 14. Process according to one of the preceding claims, characterized in that the cycloalkane is chosen from the group comprising cyclohexane and cyclododecane.

15. Process according to one of the preceding claims,
characterized in that the solvent is chosen from
the group comprising monocarboxylic acids that are
lipophilic in nature, comprising from 7 to
20 carbon atoms.
16. Process according to one of the preceding claims,
characterized in that the lipophilic acids are
chosen from the group comprising hexanoic acid,
heptanoic acid, octanoic acid, 2-ethylhexanoic
acid, nonanoic acid, decanoic acid, undecanoic
acid, dodecanoic acid, stearic acid (octadecanoic
acid) and their permethylated derivatives
(complete substitution of the hydrogens of the
methylene groups with the methyl group),
2-octadecylsuccinic acid, 1,5-ditert-butylbenzoic
acid, 4-tert-butylbenzoic acid, 4-octylbenzoic
acid, tert-butyl hydrogen orthophthalate,
naphthenic or anthracenic acids substituted with
alkyl groups, preferably of tert-butyl type,
substituted derivatives of phthalic acids, and
fatty diacids such as dimer fatty acid.
17. Process according to one of the preceding claims,
characterized in that the catalyst is chosen from
the group of transition metals.
18. Process according to Claim 17, characterized in
that the catalyst is based on manganese in
combination with a co-catalyst chosen from the
group comprising cobalt, chromium, zirconium,
hafnium and iron alone or in combination.
19. Process according to one of the preceding claims,
characterized in that the dicarboxylic acids
produced are chosen from the group comprising
adipic acid, succinic acid, glutaric acid,
dodecanedioic acid and/or a mixture thereof.